AMENDMENTS TO THE CLAIMS

This listing of claims replaces all prior versions, and listings, of claims in the application:

LISTING OF CLAIMS

1. (currently amended) A catalyst system for the polymerization of an olefin comprising:

a solid titanium catalyst component having a substantially spherical shape and a diameter from about 30 microns to about 150 microns (on a 50% by volume basis), the solid titanium catalyst component comprising a titanium compound and a support made from a magnesium compound and an alkyl silicate, wherein the alkyl silicate comprises at least one selected from the group consisting of tetramethylorthosilicate, tetraethylorthosilicate, tetrapropylorthosilicate, tetrabutylorthosilicate, and diethyldimethylorthosilicate;

an organoaluminum compound having at least one aluminum-carbon bond; and

an organosilicon compound.

2. (currently amended) The catalyst system of claim 1, wherein the alkyl silicate comprises ~~at least one tetraalkylorthosilicates~~ tetraethylorthosilicate.

3. (currently amended) The catalyst system of claim 1, wherein the alkyl silicate comprises at least one selected from the group consisting of tetramethylorthosilicate, tetraethylorthosilicate, and tetrapropylorthosilicate ~~, tetrabutylorthosilicate, and diethyldimethylorthosilicate~~.

4. (original) The catalyst system of claim 1, wherein the magnesium compound comprises at least one selected from the group consisting of magnesium chloride,

magnesium bromide, magnesium iodide, magnesium fluoride, methoxy magnesium chloride, ethoxy magnesium chloride, isopropoxy magnesium chloride, butoxy magnesium chloride, octoxy magnesium chloride, phenoxy magnesium chloride, methylphenoxy magnesium chloride, ethoxy magnesium, isopropoxy magnesium, butoxy magnesium, n-octoxy magnesium, 2-ethylhexoxy magnesium, phenoxy magnesium, dimethylphenoxy magnesium, magnesium laurate, and magnesium stearate.

5. (original) The catalyst system of claim 1, wherein the catalyst composite has a diameter from about 40 microns to about 100 microns (on a 50% by volume basis).

6. (currently amended) A solid titanium catalyst component for the production of an impact copolymer comprising:

a titanium compound; and

a support made from a magnesium compound and an alkyl silicate, wherein the alkyl silicate comprises at least one selected from the group consisting of tetramethylorthosilicate, tetraethylorthosilicate, tetrapropylorthosilicate, tetrabutylorthosilicate, and diethyldimethylorthosilicate,

the solid titanium catalyst component having a substantially spherical shape and a diameter from about 30 microns to about 150 microns (on a 50% by volume basis).

7. (currently amended) The solid titanium catalyst component of claim 6, wherein the alkyl silicate comprises ~~at least one selected from the group consisting of tetramethylorthosilicate,~~ tetraethylorthosilicate ~~, tetrapropylorthosilicate, tetrabutylorthosilicate, and diethyldimethylorthosilicate~~.

8. (original) The solid titanium catalyst component of claim 6, wherein the titanium compound comprises at least one selected from the group consisting of titanium

tetrahalides, alkoxytitanium trihalides, dialkoxytitanium dihalides, trialkoxytitanium monohalides, and tetraalkoxytitaniums.

9. (original) The solid titanium catalyst component of claim 6 further comprising an internal electron donor.

10. (currently amended) A method of making a catalyst support for a catalyst system used for the production of an impact copolymer, comprising:

contacting a magnesium compound and an alkyl silicate in a liquid medium to form a mixture, the liquid medium comprising an alcohol; and

heating the mixture to form a substantially spherical catalyst support having a diameter from about 30 microns to about 150 microns (on a 50% by volume basis).

11. (currently amended) The method of claim 10, wherein the liquid medium comprises ~~an alcohol~~ at least one selected from the group consisting of methanol, ethanol, propanol, butanol, pentanol, hexanol, and cyclohexanol.

12. (original) The method of claim 10 further comprising emulsifying the mixture.

13. (original) The method of claim 10, wherein the mixture is heated for a time from about 5 minutes to about 15 hours.

14. (original) The method of claim 10, wherein the mixture is heated to a temperature from about 40°C to about 200°C.

15. (original) The method of claim 10, wherein the catalyst support has a diameter from about 40 microns to about 100 microns (on a 50% by volume basis).

16. (currently amended) A method of making an impact copolymer, comprising:

polymerizing an olefin to provide a polyolefin matrix by contacting the olefin with ~~in the presence of~~ a first catalyst system comprising a first solid titanium catalyst component having a substantially spherical shape and a diameter from about 30 microns to about 150 microns (on a 50% by volume basis), the first solid titanium catalyst component comprising a first titanium compound and a first support made from a magnesium compound and an alkyl silicate, a first organoaluminum compound having at least one aluminum-carbon bond, and a first organosilicon compound; and

polymerizing a polyolefin rubber within the polyolefin matrix by contacting the polyolefin rubber with a second catalyst system in the presence of the polyolefin matrix, the ~~a~~ second catalyst system comprising a second solid titanium catalyst component having a substantially spherical shape and a diameter from about 30 microns to about 150 microns (on a 50% by volume basis), the second solid titanium catalyst component comprising a second titanium compound and a second support made from a second magnesium compound and a second alkyl silicate.

17. (original) The method of claim 16, wherein the first and second alkyl silicates are independently selected from the group consisting of tetramethylorthosilicate, tetraethylorthosilicate, tetrapropylorthosilicate, tetrabutylorthosilicate, and diethyldimethylorthosilicate.

18. (original) The method of claim 16, wherein polymerizing the olefin is conducted in a first reactor and polymerizing the polyolefin rubber is conducted in a gas phase reactor or a fluidized bed reactor connected in series with the first reactor.

19. (original) The method of claim 16, wherein the impact copolymer has a substantially spherical shape and an average diameter of about 500 microns or more (on a 50% by volume basis).

20. (original) The method of claim 16, wherein the olefin comprises at least one selected from the group consisting of ethylene, propylene, 1-butene, 4-methyl-1-pentene, 1-pentene, 1-octene, 1-hexene, 3-methyl-1-pentene, 3-methyl-1-butene, 1-decene, 1-tetradecene, 1-eicosene, and vinylcyclohexane.

21. (original) The method of claim 16, wherein the polyolefin rubber comprises an ethylene propylene rubber.

22. (new) A catalyst system for the polymerization of an olefin comprising:

a solid titanium catalyst component having a substantially spherical shape and a diameter from about 30 microns to about 150 microns (on a 50% by volume basis), the solid titanium catalyst component comprising a titanium compound and a support made from a magnesium compound and an alkyl silicate, wherein the magnesium compound comprises at least one selected from the group consisting of magnesium chloride, magnesium bromide, magnesium iodide, magnesium fluoride, methoxy magnesium chloride, ethoxy magnesium chloride, isopropoxy magnesium chloride, and butoxy magnesium chloride;

an organoaluminum compound having at least one aluminum-carbon bond; and

an organosilicon compound.

23. (new) A solid titanium catalyst component for the production of an impact copolymer comprising:

a titanium compound comprising at least one selected from the group consisting of titanium tetrahalides, alkoxytitanium trihalides, dialkoxytitanium dihalides, trialkoxytitanium monohalides, and tetraalkoxytitaniums; and

a support made from a magnesium compound and an alkyl silicate,

the solid titanium catalyst component having a substantially spherical shape and a diameter from about 30 microns to about 150 microns (on a 50% by volume basis).

24. (new) A method of making a catalyst support for a catalyst system used for the production of an impact copolymer, comprising:

contacting a magnesium compound and an alkyl silicate in a liquid medium to form a mixture; and

heating the mixture to a temperature from about 40°C to about 200°C to form a substantially spherical catalyst support having a diameter from about 30 microns to about 150 microns (on a 50% by volume basis).